Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Replacement of Part 90 by	)	
Part 88 to Revise the Private	)	**PR Docket No. 92-235**
Land Mobile Radio Services and	)	
Modify the Policies Governing Them	)	

To: The Commission

COMMENTS
OF THE
NATIONAL ASSOCIATION OF BUSINESS
AND EDUCATIONAL RADIO, INC.

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EXECUTIVE SUMMARY

The National Association of Business and Educational Radio, Inc. ("NABER") commends the Commission on its efforts to re-structure Part 90 of its Rules by streamlining the rules and making the rules, which govern the operation of Private Land Mobile Radio Service systems, more "user friendly." Further, NABER agrees with the Commission that the spectrum below 800 MHz currently allocated to the Private Land Mobile Radio Services can be more efficiently utilized by the implementation of advanced technologies.

220-222 MHz band, results of further research and development of very narrowband equipment and other advanced technologies, and the availability of additional spectrum by the potential re-allocation of federal government spectrum. NABER also opposes the Commission's proposal for Innovative Shared Use of a portion of the 150 MHz band.

NABER recommends a more flexible "bandwidth on demand" scheme that will not limit or restrict implementation of spectrum efficient technology developed in the future. As "bandwidth on demand" is based on contiguous spectrum, NABER recommends consolidation of the existing radio services below 800 MHz to five service pools.

Further, NABER recommends that the Commission "clean up" the RF spectrum by requiring conversion to "true" 12.5 kHz channel bandwidth operation by January 1, 2004, with the opportunity for existing users to continue 15 kHz or 25 kHz channel bandwidth operation on a secondary, non-interference basis. A 6.25 kHz channel plan is suggested to provide a "roadmap" to users to design and implement conversion to more spectrum efficient technologies, but NABER does not suggest a mandated conversion to a 6.25 kHz channel bandwidth.

NABER also submits that "pools for power" should be implemented to provide an incentive to the licensee to obtain authorizations for the least amount of spectrum in a defined operational area. NABER also comments on miscellaneous issues, such as the grandfathering of paging-only frequencies.

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Specialized Mobile Radio operators. NABER comprises over 6,000 of these businesses and service providers holding thousands of licenses in the private land mobile services.

For the past 19 years, NABER has been the recognized frequency coordinator in the 450-470 MHz and 470-512 MHz bands for the Business Radio Service. NABER is also the Commission's recognized frequency coordinator for the 800 MHz and 900 MHz Business Pools, 800 MHz General Category channels for Business eligibles and conventional SMR Systems, and for the 929 MHz paging frequencies. In its Report and Order in PR Docket No. 83-737, the Commission designated NABER as the frequency coordinator for all Business Radio Service frequencies below 450 MHz and, in a joint effort with the International Municipal Signal Association ("IMSA") and the International Association of Fire Chiefs ("IAFC"), the Special Emergency Radio Service frequencies.

In this Notice, the Commission proposes a comprehensive re-write of Part 90 of the rules which governs the operations and licensing of private land mobile radio services. This re-write is occasioned by the Commission's desire to "refarm" the bands below 512 MHz currently allocated to the Private Land Mobile Radio Services. These PLMRS bands are currently licensed, for the most part, on a shared basis. In the past several years, the bands in

421-512 MHz bands and a three-fold increase in the 72-76 MHz and 150-170 MHz bands.

In order to realize these goals, the Commission has proposed to re-channelize the bands and require narrowband operations in these bands. The Commission proposes to split the 25 kHz channels in the 421-512 MHz bands to an ultimate channel bandwidth of 6.25 kHz, and the 15 kHz channels in the 72-76 MHz and 150-170 MHz band to an ultimate channel bandwidth of 5 kHz. Additionally, to provide incentive to users to transition to these very narrowband channels, the Commission proposes to provide an opportunity to licensees to achieve exclusivity on a channel.

Recognizing that PLMRS licensees have large capital resources invested in these systems, and that such licensees will require a period of time to make the transition to the narrower bandwidth channels, the Commission proposes a two-step transition period. The first step proposed is to have the licensees reduce their channel bandwidth to 12.5 kHz in the 421-512 MHz band and 10 kHz in the 72-76 MHz and 150-170 MHz bands by January 1, 1996. The requirement to initiate operation on the very narrowband channels (or having operation meeting a minimum spectrum efficiency standard) would be implemented beginning January 1, 2004 in the top fifteen markets (as listed in the proposed Section 80.1601), and yearly thereafter for designated markets until the complete conversion of all stations by 2012.

The Commission's proposal will have a sweeping effect on the manner and method by which existing licensees operate and license

their systems. The Commission envisioned that the initial channel bandwidth reduction would be achieved by reducing the deviation of the current 25 kHz equipment, and referred to this as a "screwdriver adjustment." However, NABER has been advised by the a number of manufacturers of two-way mobile radio equipment that the existing equipment in operation today will require significant modification in order to reduce the deviation for operation on a 12.5 kHz channel bandwidth. Further, no standard modification may be made as it will vary with each type of equipment even within a product line. Additionally, the reduction in deviation reduces the audio recovery, and there may not be a means to boost the audio to

seems inadvisable to effectively preclude further licensing in the PLMR services until 1996. This may have not been the Commission's intent, but the rules, as currently proposed, would require that result. In any event, NABER believes that a transition period should be devised that permits a more gradual migration to the narrow channel bandwidth operations.

Additionally, NABER is concerned that the Commission's proposal blurs the distinction between spectrum efficiency and spectrum capacity. An increase in the number of channels available for licensing through channel splitting does not necessarily achieve spectrum efficiency, and may disadvantage certain technologies. Although it may appear more spectrum efficient, to carry more voice conversations using two 6.25 kHz or four 6.25 kHz channels than using a 12.5 kHz or 25 kHz channel, the efficiency of a system may better be determined by calculating throughput of the operation based on the communication unit/hertz/area/time. NABER, therefore, cautions the Commission against only looking at the number of channels obtained in a channelization plan utilizing either a 6.25 kHz or a 5 kHz "slotting" in determining whether its

it stifle the creativity of future inventors/engineers. Therefore, NABER envisions a flexible channelling plan that does not favor a particular technology or that does not discourage research to "build a better mousetrap."

For the reasons set forth above, NABER, through the formation of a Task Force, endeavored to develop a channelization and migration plan that was based on the needs of the users. NABER assembled a Task Force comprised of a cross-section of users, manufacturers, dealers, private carrier paging operators, and two-way private carrier operators,[2] to study and discuss the implications of the Commission's proposals and to create a regulatory structure that better meets the needs of the users of the spectrum. The focus of this Task Force was to consider an

careful balance between current licensees' interests in their systems and the future use of the spectrum.[3]

NABER, therefore, takes this opportunity to respond to the Commission's proposal and provide the Commission an alternative proposal which NABER believes addresses the concerns set forth above, has a less dramatic impact on existing licensees/users, provides incentives for existing licensees to implement more spectrum efficient operations, and will achieve the Commission's ultimate goal of increased capacity in the identified bands.

II. COMMENTS

NABER compliments the Commission for having the vision and the courage to undertake the arduous task of implementing a channeling, licensing and operating scheme that will take the PLMRS into the next century and the next generation of advanced technology. The Commission's proposed structure for Part 88 as compared to Part 90 is "user-friendly" and overcomes many of the difficulties associated with finding rule sections that address a particular issue or method of operation. Accordingly, NABER believes that the Commission's efforts are laudable and proposals set forth in the Notice have been an important starting point for the private land mobile radio industry to focus on where we are and

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[3] As previously discussed, not all participants involved in the Task Force agree with each position taken in these Comments. The end result is based on a majority opinion rather than on an unanimous decision. On May 4, 1993, NABER filed its White Paper, Refarming Below 800 MHz "Bandwidth on Demand" with the Commission, which was placed on Public Notice on May 6, 1993.

where we must be to provide continued service to existing licensees and future users.

However, the proposals set forth by the Commission in terms of channeling plans and transition periods have raised an immense amount of concern by current licensees. These licensees are troubled by the aspect of losing the investments made in their systems, of having to invest additional capital to make major system changeovers (perhaps twice as suggested by the Commission's proposal), and of losing the viable, operating systems on which their business depend, either directly or indirectly.

NABER and its members recognize that the continued regulatory scheme for the PLMRS below 512 MHz will ultimately result in gridlock in many of the major metropolitan areas, and modifications must be made to prevent the loss of telecommunications in these areas. In order to accomplish these results, NABER understands that existing licensees must endure some inconvenience and expense to achieve the better service for the common good of all users, existing and future. Similarly, the Commission must recognize that, in recent years, a number of the traditional users below 512 MHz have consciously chosen to license in this band because the quality of service is not as important as the economics associated with the service in these bands. Thus, the benefits achieved by the Commission's proposal, such as more channels to be licensed, exclusivity, trunking efficiency, must balance the benefits lost by the individual licensees, such as economical radio services.

A. GOALS OF THE NABER PROPOSAL

Like the Commission, NABER first identified the goals that its members were seeking to achieve in revising the regulations that currently govern the various PLMRS. The goals that NABER and its members wish to see obtained by the "refarming" of the PLMRS spectrum are as follows:

1. Contiguous Spectrum Bands for the Mobile Radio Services
2. Spectrum Efficiency and Increased Capacity
3. Workable Migration Plan
4. Revised Service Pools
5. Streamlined rules
6. Level Playing Field
7. Minimal Disruption of Existing Operations
8. Achievement of Primary Protection for Current Offset Users
9. Establishment of a Home for Low-Power, Site Specific or Non-Site Specific Systems with Low Entry Cost
10. Amortization of Existing Radio Equipment over a Reasonable Life Span of the Equipment
11. Consistency with the Long-Term Budgeting Process of Large Users and Government Users
12. Availability of Spectrum for all Types of Spectrum Efficient Equipment

B. NABER'S ALTERNATE PROPOSALS FOR CHANNELIZATION/EFFICIENCY STANDARDS/SERVICE POOLS/TRANSITION PERIODS

With the aforesaid goals in mind, NABER requests the Commission to modify the Commission's proposal to conform with the following recommendations:

1. NABER's "Bandwidth On Demand"

NABER promotes the adoption by the Commission of contiguous blocks of spectrum for each user pool (regardless of the number of pools ultimately adopted). This will provide more flexibility in future years to implement new advanced technologies. The channelization of the spectrum has been a controversial issue in the discussions among the Task Force members. Most members agree that the first step that is required to be taken, and that may be accomplished, is the reduction of the current systems to operation

years. During this period, the equipment manufacturers should be able to identify future technologies that may be implemented in the next twenty years, and the Commission will be able to consider the results of the narrowband channelization in the 220-222 MHz band.

Further, additional spectrum may become available from the federal government for allocation by the Commission for non-government use. The Commission may consider allocating a portion of this spectrum for advanced technologies and may determine it

It is NABER's belief that the Commission should not favor any one technology over another. A spectrum efficient technology for one type of use may not be efficient for another type of use. The purpose of "slotting" the spectrum into narrowband channels is to enable applicants to request one or more contiguous blocks of channels for a system which suits the individual users' needs. The alternative of setting aside discrete blocks of channels for one type of technology has the disadvantage of limiting the use of one or another technology when a technology block is exhausted. "Slotting" permits a mixture of technologies, without favor to any technology.

For the "slotting", it was necessary to determine the "lowest common denominator" which would permit: (1) natural reductions during the transition phase; (2) single channel use with a spectrum efficient technology; (3) the ability to combine slotted channels for efficient, wide-band technology with minimal wasted bandwidth; and (4) reduce the number of different types of equipment which manufacturers would need to produce. In weighing the four factors, the Task Force found that there was not a clear "winner." In regard to a natural reduction during the transition period, the Task Force recognized that currently, in the 150-170 MHz band, an applicant may obtain a license for narrowband operations.[4] Additionally, NABER's two-step transition proposal outlined below will support a final very narrow channel bandwidth of either 5 kHz or 6.25 kHz. Reassigning center frequencies during the second step

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[4] See 47 C.F.R. § 90.271.

allows channels to be rearranged as needed independent of the final very narrow bandwidth chosen.

In considering the second factor, the discussion focused on the availability of equipment and the cost to migrate to the newer narrowband equipment. This discussion highlighted several of the members concern that the more narrowband equipment, whether using 6.25 kHz or 5 kHz, may not be successfully developed to meet the needs of the users. Conversely, a number of members are adamant that 5 kHz equipment will be successfully developed and will provide the most spectrum efficient operations. Ultimately, the majority of the Task Force members were convinced that, in a congested environment such as the 150 MHz and 450 MHz bands, development of equipment using a 6.25 kHz channel would have the more likelihood for viable operation.

Although there is considerable sentiment for using a 5 kHz baseline, it is the majority opinion that a 5 kHz channelling plan has a major deficiency in that it would prevent 6.25 kHz narrowband equipment from being effectively utilized. If 5 kHz channels are utilized, an applicant desiring the use of 6.25 kHz narrowband equipment would need to request two (2) 5 kHz channels, resulting in the potential of 3.75 kHz of "wasted" bandwidth. Whereas, an applicant desiring the use of 5 kHz channel bandwidth equipment would receive a 6.25 kHz bandwidth channel, with 1.25 kHz of "wasted" bandwidth.

Thirdly, NABER's "bandwidth on demand" approach makes contiguous spectrum available for wideband operation on combined

channels. Either 5 kHz or 6.25 kHz very narrow bandwidth channels will work equally well when combined together, as long as all of the very narrow bandwidth channel "building blocks" are the same size.

Finally, in relation to the fourth factor discussed in determining the lowest common denominator for channel "slotting," should the Commission establish 5 kHz bandwidth channels in the 150 MHz band and 6.25 kHz channels in the 450 MHz band, manufacturers may be required to produce two different bandwidth narrowband equipment types. NABER recognizes that manufacturers may choose to produce different bandwidth narrowband equipment, but NABER does not believe that the public interest is served in mandating such a requirement. Each manufacturer should be given the flexibility to determine where it wishes to expend its research and development resources. This should provide the users more choice, and more competition between the manufacturers. Therefore, NABER believes that the Commission should "slot" the channels in the 150 MHz and 450 MHz bands with the same bandwidth channels.

For these reasons, NABER proposes that system operations be reduced to 12.5 kHz channel bandwidth with a 6.25 kHz channel plan put in place for both the 150 MHz and 450 MHz band.[5] By

[5] NABER is aware that in the 150 MHz band, there is a

maintaining channel centers, NABER's plan will create an incentive for current users to reduce channel bandwidths in advance of any mandatory change.

2. NABER's "Equivalent Efficiency"

NABER promotes the use of an "Equivalent Efficiency" standard. In conjunction with and as part of NABER's Task Force, representatives of TIA have agreed to develop a standard that can be applied to any technology desired by the user. TIA's standard will be based upon some formula which takes into account factors such as, the size of the service area requested, the amount of spectrum requested, the reliability of the system and the number of users proposed to serve. An applicant's "Bandwidth on Demand" would be dependent on meeting this criteria. An applicant could request a wider bandwidth provided that the applicant demonstrates that the efficiency of the proposed wide-band system meets the standard.

Thus, for example, a single 12.5 kHz bandwidth channel utilizing digital emissions could be granted based upon the applicant's demonstration that the proposed system meets the efficiency standard. Alternatively, another applicant could be granted two (2) 6.25 kHz channels utilizing narrowband technology, based upon its demonstration that the system meets the efficiency standard. Multiple channels could be requested for trunking with a similar demonstration.

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with the recommendations made for operations in this band where there is contiguous spectrum within the service pool which includes the railroad radio service.

3. NABER's "Exclusivity For Efficiency"

One problem which has historically plagued the land mobile industry is the tendency of applicants to "over-engineer" a system. Specifically, applicants often request a larger service area than otherwise needed to serve the applicant's real needs. This decreases spectrum efficiency, as fewer systems can be accommodated on a single channel in a given area.

In order to correct this flaw in the assignment system, there are two options. The Commission has proposed to increase the number of systems on each channel, and thereby spectrum efficiency, by restricting the maximum size of an applicant's service area. However, while this option has the potential to increase the number of systems on each channel, the option does not necessarily translate into increased spectrum efficiency. Specifically, where an applicant actually needs a service area greater than permitted by the Commission (but which could be served by a single transmitter site), the applicant will need to apply for multiple stations. The waste of resources and increased cost necessitated by multiple stations (where multiple stations are technically not necessary) is counter-productive to the Commission's goals in this proceeding.

Further, the Commission's option favors private carrier systems and discourages private user systems, as private carriers will be the entity most likely to be able to afford the build-out

of a multiple-site system.[6] While there is a tremendous need for private carrier systems which should be accommodated by the Commission in this proceeding, the Commission must recognize the need for private user systems. Users such as railroads, manufacturing plants and companies such as Federal Express and Yellow Freight must be able to economically install private systems.

NABER believes that the Commission must provide applicants with an incentive to request only that size service area which is necessary. Such an incentive would not only increase spectrum efficiency (by achieving the appropriate number of systems per channel which would serve all users needs), but it would also reduce the burden on the Commission and frequency advisory committees, by eliminating the need to determine whether the service area requested matches the technical parameters in the application.

In areas where spectrum is available, NABER proposes that an applicant could achieve channel exclusivity, provided that the applicant meets or exceeds an efficiency/loading factor which NABER has requested be developed by TIA. An applicant requesting the smallest channel bandwidth and smallest service area would have a lower threshold to achieve exclusivity. Conversely, an applicant

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[6] Recently, the House proposed amendment to the Communications Act of 1934, as amended (the "Act"), in which Section 332(c) of the Act would be modified to classify providers of mobile services for profit as common carriers. Should this draft proposal be enacted, the Commission's proposal in this Notice favoring private carriers may result in small businesses being unable to economically obtain the service necessary.

requesting wider channel bandwidth and a larger service area would have a higher threshold to achieve exclusivity. This standard would encourage applicants to use the smallest service area and bandwidth to serve the user's needs, thereby increasing spectrum efficiency.

Thus, for example, an applicant which has communication needs in Southern California could elect to place a single transmitter site atop Mount Wilson. This system, serving a large area with an omnidirectional antenna, would include areas for which the applicant did not truly require communications. Under NABER's proposal, the applicant for this single transmitter site would have a higher efficiency/loading threshold to meet to achieve channel exclusivity. Alternatively, the same applicant could voluntarily request several transmitter sites at lower elevations, serving more tightly controlled service areas, enabling other users to utilize the channel in other areas precluded by the Mount Wilson operation. Under NABER's plan, each smaller transmitter site would have a lower efficiency/loading threshold to meet to achieve channel exclusivity. Unlike the Commission's proposed power/height requirements, under NABER's scheme, the applicant would be able to select his/her own system design to best serve the applicant's requirements, but provide the applicant with an incentive to be spectrum efficient.

4. Contiguous Spectrum

The channeling of the spectrum into 6.25 kHz "slots", while permitting the combining of channels to achieve a 12.5 kHz channel

bandwidth or larger where appropriate, will not preclude the use of any spectrum efficient technology in development now or in the future. The "slots" would support the use of single sideband, TDMA digital, etc. Contiguous channels within a service pool would ensure that combining of channels for larger bandwidths could be accomplished with minimal effort.

5. NABER's Migration "Funnel"

NABER is concerned that the Commission's "screwdriver" adjustment, reducing the channel bandwidth of current radio

during the transition period, such sacrifices must be in proper relation to the spectrum efficiency achieved.

Two Step Migration. NABER's two-step migration process involves the use of a "funnel" type mechanism which would permit the immediate (but not mandatory) use of narrowband equipment, if desired by the user, in the existing RF environment. This first step would appear to keep the status quo without the increase in number of channels as proposed by the Commission. However, as described below, the "cleaning up" of the land mobile spectrum during Step One should yield additional assignable spectrum and less adjacent channel interference.

a. Step One. Step one involves the discontinuation by the Commission of type acceptance for new, 25 kHz or 30 kHz bandwidth analog equipment (other than equipment utilized for paging operations) as soon as practical. NABER concurs with the recommendation made by the Land Mobile Communications Council in its Consensus Plan[7] that after January 1, 1996, the Commission should type accept equipment to be operated in the PLMRS bands below 800 MHz (except on paging-only frequencies) that is capable of operating in 12.5 kHz channel bandwidths. It is NABER's understanding that 12.5 kHz equipment can readily be made available. There will need to be a period of time during which users can add 25 kHz units to an existing system, provided users recognize that such systems could operate in wide-band mode for a

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[7] Filed April 28, 1993 and placed on Public Notice on May 6, 1993. NABER actively participated in the LMCC group assisting with the drafting of the Consensus Plan.